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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/685,489	10/16/2003	Yasuko Fujisawa	243997US2S	5374

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EXAMINER	
BITAR, NANCY	
ART UNIT	PAPER NUMBER
2624	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	02/09/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	**Application No.** 10/685,489	**Applicant(s)** FUJISAWA, YASUKO
	Examiner Nancy Bitar	**Art Unit** 2624

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 October 2003*.
2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.
3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5)☐ Claim(s) _____ is/are allowed.
6)☒ Claim(s) *1-20* is/are rejected.
7)☐ Claim(s) _____ is/are objected to.
8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.
10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a)☒ All b)☐ Some * c)☐ None of:
1.☒ Certified copies of the priority documents have been received.
2.☐ Certified copies of the priority documents have been received in Application No. _____.
3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *12/30/2004, 10/16/2003*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 U.S.C. § 103

1. The following is a quotation of 35 U.S.C. § 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-20 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Czerman et al and in view of Drummond et al (US 6,628,743) .

As to claim 1, Czernin et al. teaches an image processing apparatus, comprising: an index computing unit configured to compute motion functional indices (heart activity, Polar Maps") of a particular organ from volume data of a subject including said particular organ (heart activity, section 5, Polar Maps") a polar map generating unit configured to generate a polar map by developing said indices on a polar coordinate system Polar maps can be thought of as the image that would be obtained if one took a 3-D cone-shaped heart activity image and projected it onto a single plane, section 5 "Polar Maps"); an image generating unit configured to generate, from said volume data, an image related to a structure of one of said particular organ and a peripheral organ developed on the polar coordinate system(NH3 images for various planes and the corresponding polar map with the coronary blood vessel supply region superimposed, section 5 "Polar Maps");

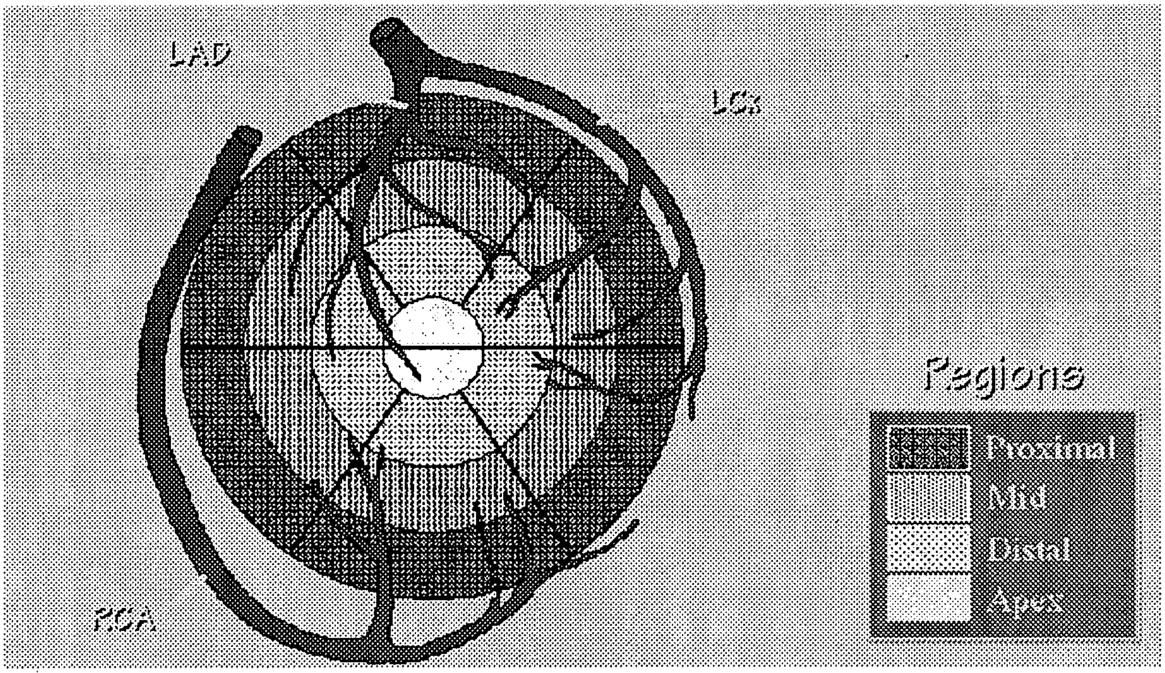
a fusing unit configured to fuses said image into said polar map; and a display unit configured to displays a polar map fused with said image Polar maps are derived by combining images from multiple planes (designated by the circle around the myocardium in the above images) so that information about the entire myocardium can be displayed in a single image, section 5 "Polar Maps").

While Czernin meets a number of the limitations of the claimed invention, as pointed out more fully above, Czernin fails to specifically teach the image generating unit configured to generate, from said volume data, an image related to a structure of one of said particular organ and a peripheral organ. Specifically, Drummond et al teaches acquiring volume of cardiac data from the CT imaging system 100 wherein post-processing of cardiac data relating to coronary artery disease, acute cardiac syndromes, coronary artery imaging, cardiac function analysis, myocardial perfusion analysis, myocardial perfusion defect analysis, automated left ventricle delineation, automated volume rendering, automated cardiac phase selection, end diastole volume analysis, end systole volume analysis, stroke volume analysis, ejection fraction analysis, and cardiac output analysis, all from a single cardiac CT scan (column 5, lines 16-54) . Because the CT imaging device generates an image related to a structure of heart and a coronary artery. It would have been obvious to one of ordinary skill in the art to use the CT imaging device in generating NH3 images and blood vessels images of Czernin since CT imaging generating unit helps diagnose cardiovascular without waiting to stabilize the patient before performing the critical diagnostic test and disorder and avoid need for surgical inspection. Therefore, the claimed invention would have been obvious to one of ordinary skill in the art at the time of the invention by applicant.

As to claim 2, Czernin et al. teaches the image processing apparatus according to claim 1, wherein said particular organ is a heart, said motion function is a contraction rate of a myocardium (information about the entire myocardium, section 5" Polar Maps"), and said peripheral organ is a coronary artery (coronary blood vessel, section 5 "Polar Maps").

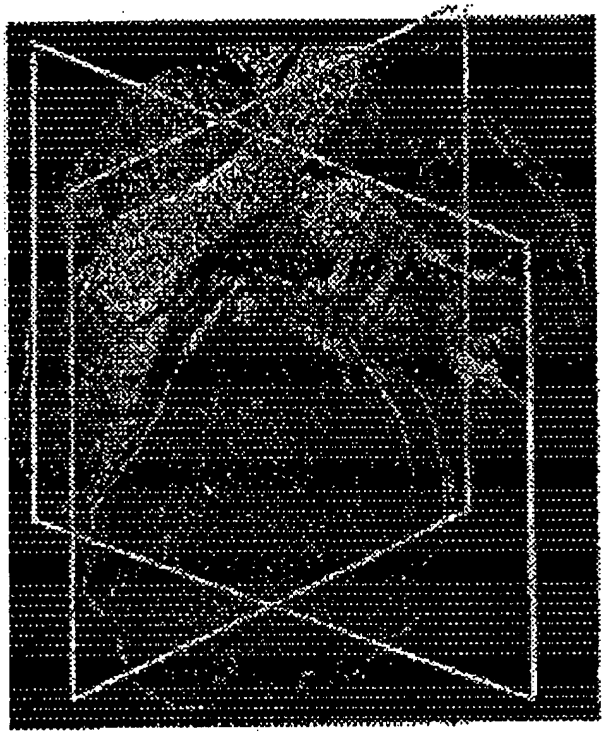
As to claim 3, Czernin et al. teaches the image processing apparatus according to claim 2, wherein said polar coordinate system is expressed by an angle about a myocardial axis of the heart, and a distance from one of an apex and a base of the heart (Each image plane forms an annulus in the polar map (i.e. the outer annuli of the polar map correspond to the proximal regions of myocardium, whereas the inner rings are derived from the apex). The annulus from each plane is divided into an arbitrary number of sectors (usually 60) which tends to smooth the data, section 5 "Polar Maps").

As to claim 4, Czernin et al. teaches the image processing apparatus according to claim 2, wherein said coronary artery is searched through a range within a certain distance from an outer wall of the myocardium (the relationship between the coronary blood supply and the polar map image. The regions (proximal, mid, distal and apex) of the heart that comprise the polar map are also indicated. (RCA=Right Coronary Artery; LAD=Left Anterior Descending Artery; LCx=Lateral Circumflex Artery).



While Czerman et al meets a number of the limitations of the claimed invention, as pointed out more fully above, Czermin et al fails to specifically teach the image related to a plane passing an arbitrary point on said image being displayed and image of the coronary artery. Specifically, Drummond et al. et al. teaches a first volume of cardiac data from a medical scanner, processing the first volume of cardiac data for image reconstruction and visualization, acquiring a subsequent plurality of volumes of cardiac data from the medical scanner, processing the subsequent plurality of volumes of cardiac data for image reconstruction and visualization, and reconstructing and visualizing first and second image sets from the acquired first and the subsequent plurality of volumes of cardiac data and the view of the heart with long axis section planes displayed (figure 10) Because the view of the heart image with respect to the coronary artery on a plane provide a clear indication of the perfusion levels of the various regions of interest thus enable the clinician to make differential diagnosis of the perfusion defect between the regions of interest, column 8, lines 60-65). It would have been obvious to one of ordinary skill in the art to teach the image in a plane in Czermin polar map in order to provide an accurate non-invasive way to measure cardiac function and ventricular wall thickness using computed topographic images. Therefore, the claimed invention would have been obvious to one of ordinary skill in the art at the time of the invention by applicant.

As to claims 7 -9, Drummond et al. teaches the image processing apparatus according to claim 6, wherein said plane is parallel, perpendicular and curved to said myocardial axis of the heart (figure 10, isometric view of the heart with long axis section planes displayed).



Claims 10-18 differ from claims 1-9 only in that claims 10-18 are methods claims whereas, claims 1-9 are system claims. Thus, claims 10-18 are analyzed as previously discussed with respect to claims 1-9 above.

Claims 19-20 differ from claims 1-9 only in that claims 19-20 are x-ray CT apparatus (CT imaging system 100) claims whereas, claims 1-9 are system claims. Thus, claims 19-20 are analyzed as previously discussed with respect to claims 1-9 above.

Conclusion

3. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Goris et al (US 5,970,182) is cited to teach myocardial imaging, and in particular to myocardial image registration, and more particularly to myocardial image registration using non-rigid transformations such as a global affine transformation.

Hosegawa (US 5,800,355) is cited to teach image processing apparatus, and more particularly to a medicine image processing apparatus for correcting twist of the myocardium, adaptable to a nuclear medicine diagnosis apparatus, such as a single photon emission computed tomography (hereinafter called as a "SPECT") for scanning a tomography image of the heart using polar map.

Inquiries

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nancy Bitar whose telephone number is 571-270-1041. The examiner can normally be reached on Mon-Fri (7:30a.m. to 5:00pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Joseph Mancuso can be reached on 571-272-7695. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Nancy Bitar

02/02/2007

JOSEPH MANCUSO
SUPERVISORY PATENT EXAMINER